

ABSTRACT

[0090] A power supply apparatus includes a switching regulator, a series regulator, and a controller. The switching regulator performs start and stop operations in response to a first control signal and generates a first constant voltage in response to a first voltage switching signal to output the second constant voltage. The series regulator performs start and stop operations in response to a second control signal and generates a second constant voltage in response to a second voltage switching signal to output the second constant voltage. The controller generates the first and second control signals and the first and second voltage switching signals and controls the switching regulator and the series regulator to simultaneously operate for at least a predetermined time period using the first and second control signals, respectively, and such that an output voltage of the switching regulator is greater than an output voltage of the series regulator.